

Section 12: Speed and Power Recommendations

In This Section

- Engraving Speed
 - Engraving Power
 - Recommendations
 - Multiple Passes
 - Speed and Power Recommendation Tables
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Engraving Speed

Speed settings determine the travel speed of the carriage as it moves back and forth in Raster Mode and as it profile cuts in Vector Mode. Speed is adjustable in the print driver in 1% increments from 1 to 100%. The slower the speed, the deeper the engraving or cutting. Speed settings are heavily dependent on the hardness and the thickness of the material being engraved, with harder materials requiring slower speeds for deeper engraving or cutting. In Raster Mode, state-of-the-art optimization software allows the carriage to skip through all white space both horizontally and vertically, increasing laser on-time rates, which further enhances overall throughput.

Engraving Power

This is the amount of laser power that is applied to the material surface. At a given speed, higher power will produce deeper cutting or engraving. Adjustable in 1% increments, the power can be controlled either from your computer or from the control panel on the engraver. Power can also equate to speed. A 45 watt laser can travel faster than a 25 watt laser and achieve the same depth of cut into wood without a subsequent loss in quality. This means you can produce more products faster. A 45 watt laser will also cut through marginally thicker materials than a 25 watt laser.

Section 12: Speed and Power Recommendations

Recommendations

The Epilog Mini Speed and Power guidelines are included on the following pages. Please remember that these are only guidelines. Depth of cut is a matter of personal preference. As such, there is no “correct” setting. Working with the Speed and Power settings becomes fairly intuitive in a very short period of time for most users. If you have a material that is not listed, try to compare its hardness and feel to some of the materials listed and use the settings of a similar material as your starting point for Speed and Power settings.

The two most basic rules for determining Speed and Power are:

1. Hard materials generally engrave and cut at low speeds and high power.
2. Soft materials generally engrave and cut at high speeds and low power.

Depth will increase if the power is increased, or if the speed is decreased. If you do not achieve the results you are looking for with the following recommended settings, try resending the job and start by changing only the Power setting. If this does not provide the desired results, revert back to the recommended Settings and change the Speed settings. Changing only one variable at a time will help to determine the correct setting for your material. It is easiest to change the speed or power variable in 10% increments when you are experimenting. This will save time and allow you to refine your settings later in 1 or 2% increments.

Because there are many factors that influence the time it takes to engrave or cut a given image, the Speed settings were designed to be reference numbers only. The Speed setting scale of 1% to 100% is not linear – i.e. 100% speed will not be twice as fast as 50% speed. This non-linear scale is very useful in compensating for the different factors that affect engraving time, but using speed to predict a jobs engraving time is not practical.

The Power settings are linear – i.e. 50% power is half as much as 100% power.



An important note: Speed and Power settings can sometimes be confusing because not all materials that *can* be marked at the highest speeds and powers *should* be marked at the highest speed or power. Many users feel that if a mark *can* be made at high speed, it’s just a matter of adjusting the power to produce an acceptable mark. Unfortunately, for some materials, this isn’t always the case. For some materials, the length of time the laser reacts with the material is much more important to producing

Section 12: Speed and Power Recommendations

a good mark than the raw speed of the system or the amount of laser power that is output by the laser.

The interaction of the laser with different materials is a complex process, and this is especially true for some materials that are actually two different materials that have been bonded together. Since the laser interacts differently with each layer of material (and sometimes even the bonding agent), you may be better off slowing the machine down to give the laser time to properly interact with the different layers in the material.

If you have a multi-layered material that you can mark easily, but not well, at high speeds, try lowering the speed to see if that produces a better mark. If you're able to produce a better mark, but it's overpowered, lower the power also.

Multiple Passes

Some materials look better if you make more than one pass. For example, with plastics, some colors – like blue – are very aggressive and tend to leave a shadow on some substrates. It is often easier to make one pass at the recommended speed and power setting, and then make another pass at the same speed, but with a greatly reduced power setting to achieve the desired results. If the material is not moved between passes the alignment of the second pass should be identical to the first pass.

Vector cutting may also require multiple passes. If you find that you cannot cut completely through a material or if you are melting a material in a single pass, try making two or even three passes instead of just one. Some materials are not laser compatible, but can be cut anyway if a gentle touch is used. Some users like to refocus between passes, but this is a matter of personal preference. Multiple passes may also allow you to cut through thicker materials than the laser is rated for.



See how to automatically engrave or cut multiple passes at the end of the *Using the Epilog Dashboard* section of this manual.

Section 12: Speed and Power Recommendations

50 Watt - Epilog Mini/Helix

	300 DPI RASTER ENGRAVING	400 DPI RASTER ENGRAVING	600 DPI RASTER ENGRAVING	VECTOR CUTTING
	SPEED/POWER	SPEED/POWER	SPEED/POWER	SPEED/POWER/FREQUENCY
Wood Cherry – Alder - Walnut	30/100	50/100	70/100	1/8" (3 mm) – 30/80/500 1/4" (6 mm) – 10/100/500 3/8" (9.5 mm) – 6/100/500 (two passes may produce better results)
Acrylic	100/50	100/40	100/35	1/8" (3 mm) – 15/100/5000 1/4" (6 mm) – 8/100/5000 3/8" (9.5 mm) – 3/100/5000 (two passes may produce better results)
AlumaMark	100/40	100/35	100/30	N/A
Anodized Aluminum	100/60	100/50	100/40	N/A
Painted Brass	100/35	100/30	100/25	N/A
Marbleized Painted Brass	100/45	100/40	100/35	N/A
Corian Or Avonite	20/100	30/100	40/100	1/8" (3 mm) – 50/100/5000
Delrin Seals	100/60	100/50	100/40	60/95/5000
Glass	30/100	40/100	50/100	N/A
Laserable Plastic	100/50	100/40	100/30	30/50/5000
Leather	100/50	100/40	100/30	1/8" (3 mm) - 50/80/500
Marble	20/100	40/100	60/100	N/A
Mat board	100/65	100/55	100/45	50/50/500
Melamine	100/80	100/70	100/60	N/A
Stainless Steel With Cerdec Coating	N/A	35/100	40/100	N/A
Rubber & Rubber Stamps	15/100	20/100	30/100	20/100/100